

CLAIMS

1. A method of screening a subject for disorders of glucose metabolism, comprising steps of:

5 measuring a glucose profile, said profile comprising a plurality of blood glucose concentrations from at least after a glucose or meal challenge;

 using at least a portion of said plurality of blood glucose values, evaluating a shape of said profile according to at least one parameter of said profile; and

 classifying said subject into at least one predetermined class based on
10 evaluation of said shape.

2. The method of Claim 1, wherein said plurality of blood glucose values comprises a time series.

15 3. The method of Claim 1, wherein said blood glucose values are actual values.

4. The method of Claim 1, wherein said blood glucose values are relative values.

5. The method of Claim 1, wherein said parameters include any of:
20 initial fasting glucose concentration;
 maximum glucose concentration;
 glucose concentration after elapse of a predetermined time interval;
 area under the curve of the glucose profile; and
 area under the curve of the glucose profile over a defined period of time.

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6. The method of Claim 5, wherein said evaluating step comprises:
comparing any of said parameters with corresponding predetermined values
and/or ranges of values indicative of either a normal condition or one of a plurality of
abnormal conditions.

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7. The method of Claim 6, wherein said predetermined classes correspond to
said conditions, said classes comprising:

normal;

impaired glucose tolerance; and

10 diabetic.

8. The method of Claim 1, wherein said evaluation step comprises:
determining a weight for each of said parameters.

15 9. The method of Claim 8, wherein said step of determining a weight comprises
assigning each parameter a value on either a linear or non-linear scale, according to
value of said parameter, said assigned value comprising said weight.

10. The method of Claim 9, wherein minimum and maximum of said scale
20 correspond to predetermined threshold values for a normal condition and a diabetic
condition, respectively.

11. The method of Claim 9, wherein minimum and maximum of said scale
correspond to predetermined threshold values for a low glucose tolerance and a
25 normal condition, respectively.

12. The method of Claim 9, maximum of said scale corresponds to predetermined threshold values for a diabetic condition.

5 13. The method of Claim 9, wherein ranges of values represented by said scale are established according to standard diagnostic criteria.

14. The method of Claim 9, wherein missing parameters are assigned a weight of zero.

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15. The method of Claim 9, wherein missing data are supplied from historical data.

16. The method of Claim 9, further comprising a step of calculating one or more
15 screening factors based on actual or relative values of said parameters and said weights.

17. The method of Claim 16, wherein said step of calculating screening factors
comprises the step of calculating a weighted average of said weighted parameters
20 according to:

$$SF = \frac{(P_1W_1 + P_2W_2 + P_3W_3 + P_4W_4 + P_5W_5 + P_6W_6)}{(W_1 + W_2 + W_3 + W_4 + W_5 + W_6)}$$

wherein SF = said screening factor.

18. The method of Claim 16, wherein said step of calculating screening factors comprises the step of calculating a weighted average of said weighted parameters according to:

$$SF_2 = \frac{(P_7W_7 + P_8W_8)}{(W_7 + W_8)},$$

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wherein SF_2 = said screening factor.

19. The method of Claim 16, wherein said step of calculating screening factors comprises the step of calculating a weighted average of said weighted parameters according to:

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$$SF_3 = \frac{(P_1W_1 + P_2W_2 + P_3W_3 + \dots + P_nW_n)}{(W_1 + W_2 + W_3 + \dots + W_n)},$$

wherein SF_3 = said screening factor.

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20. The method of Claim 16, wherein said step of calculating screening factors comprises steps of:

calculating a weighted average of a first set of selected weighted parameters according to:

$$SF_4 = \frac{(P_1W_1 + P_6W_6)}{(W_1 + W_6)},$$

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wherein SF_4 = a first screening factor; and

calculating a weighted average of a second set of selected weighted parameters according to:

$$SF_5 = \frac{(P_2W_2 + P_3W_3 + P_4W_4 + P_5W_5)}{(W_2 + W_3 + W_4 + W_5)},$$

5 wherein SF_5 = a second screening factor.

21. The method of Claim 16, further comprising a step of establishing threshold screening limits based on said screening factors.

10 22. The method of Claim 1, wherein said parameters include any of:

initial fasting glucose concentration;

rate of increase of glucose concentration following said glucose challenge;

peak monitored glucose concentration;

duration glucose remains elevated;

15 rate of decrease of glucose concentration following said peak concentration;

minimum glucose concentration following said peak concentration;

area under the curve for the glucose profile; and

area under the curve during a subset in time of the glucose profile.

20 23. The method of Claim 1, further comprising the step of advising said subject of screening results.

24. The method of Claim 1, further comprising the step of advising said subject of health risks from complications likely to result from subject's condition.

25. The method of Claim 1, wherein said values are obtained using any of:
a noninvasive blood glucose analyzer;
a minimally invasive blood glucose analyzer; and
an invasive blood glucose analyzer.

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26. The method of Claim 1, wherein a processing device so programmed
executes said steps.

27. The method of Claim 1, wherein said profile comprises a plurality of blood
10 glucose concentrations from before and after a glucose or meal challenge.

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